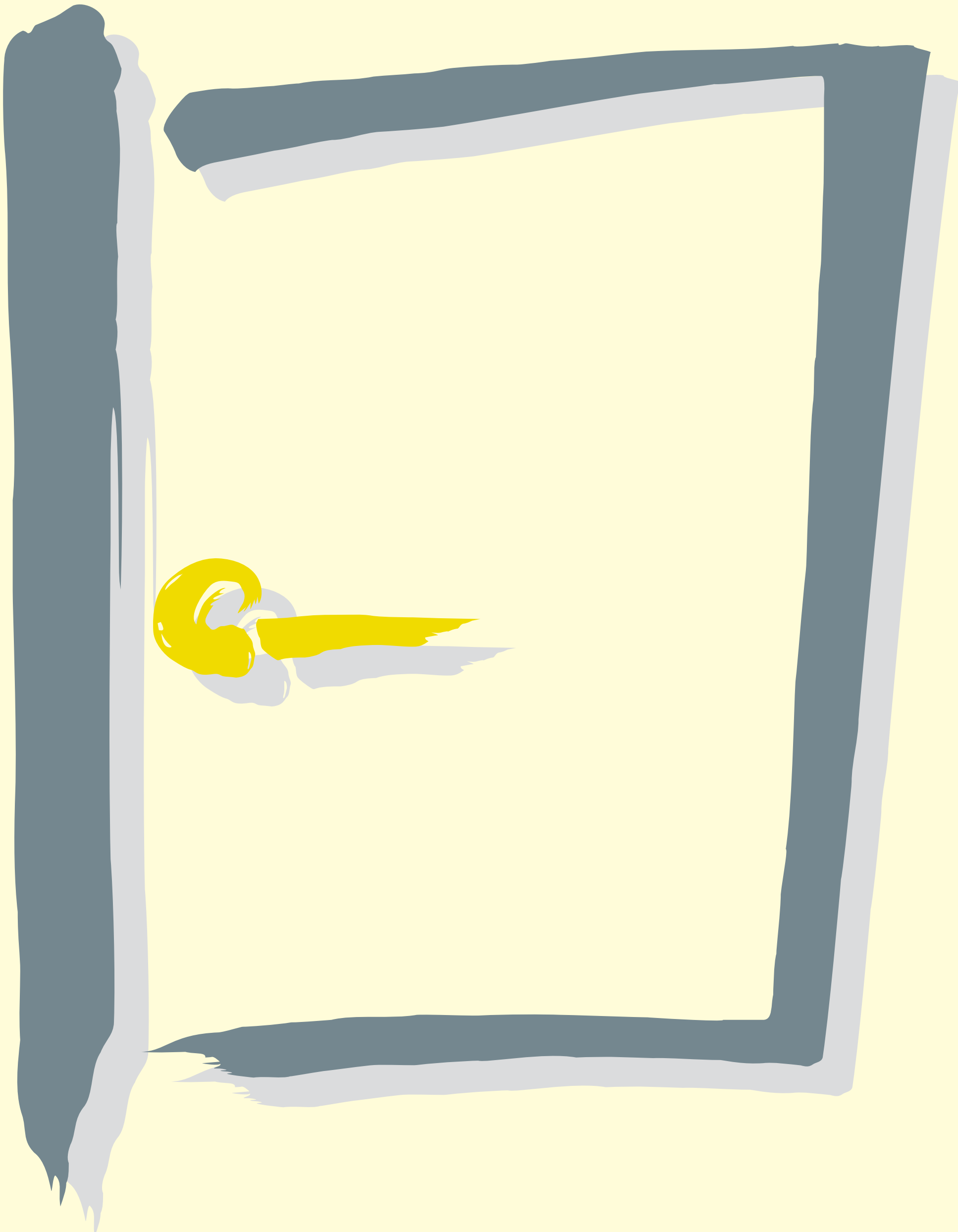
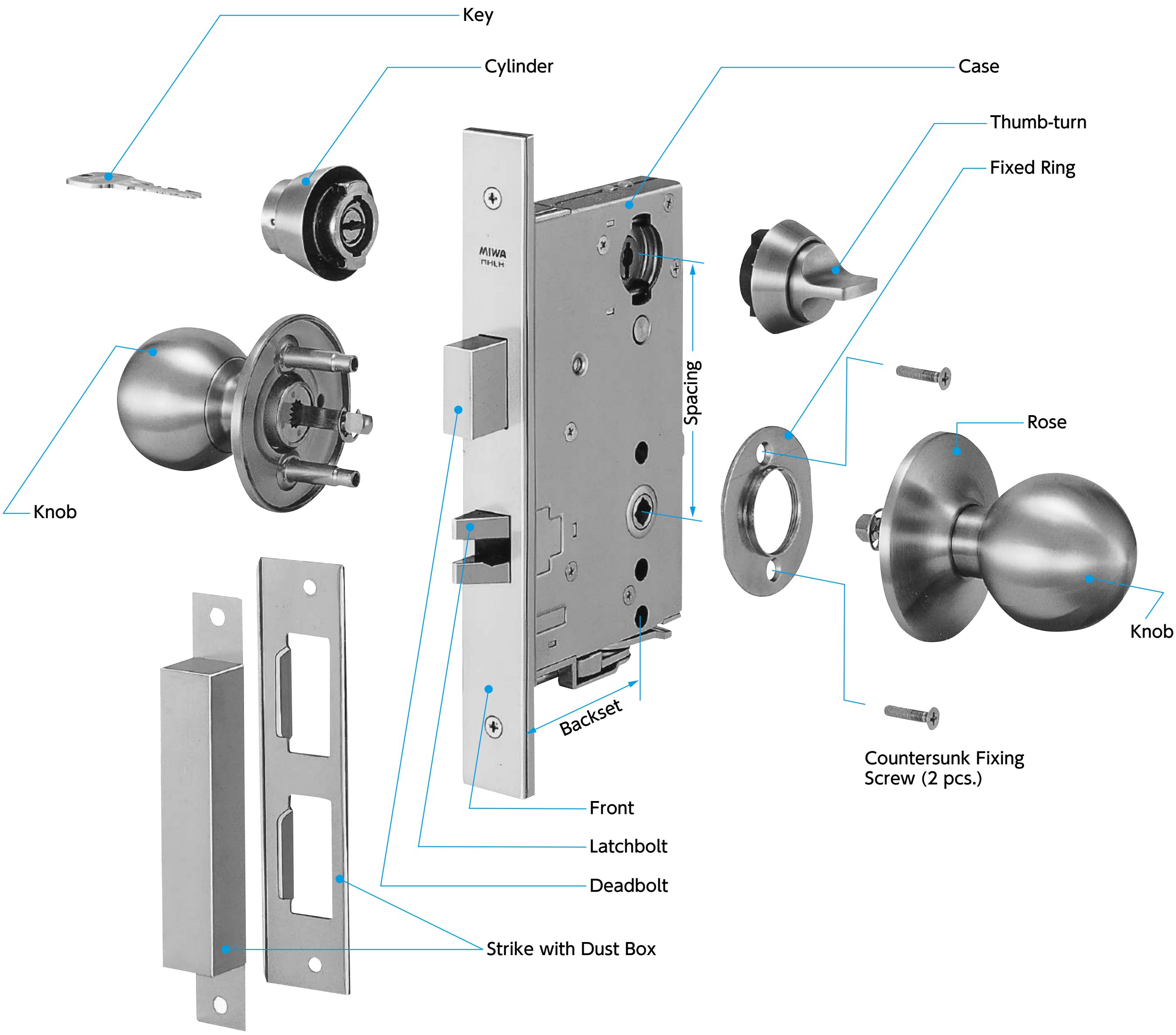


For understanding door locks

CONTENTS

WORKING PARTS OF A LOCK

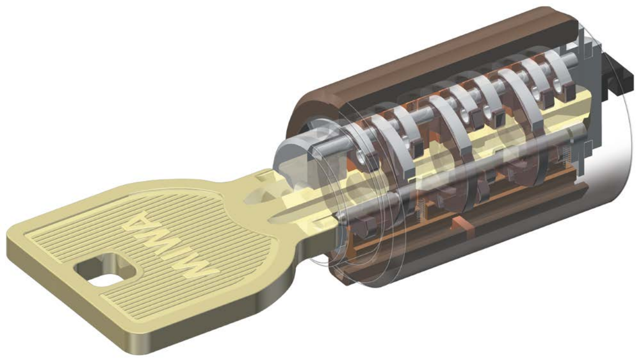


Thumb-turn	On the inside of a door equipped with cylinder lock, connected to lock cam. Operates deadbolt.
Knob	Serves as handle, operates latchbolt.
Front	This is the surface of the mortice lock case which appears at the cut end of the door. It includes openings for latch bolt and deadbolt as well as holes for screws which secure it.
Deadbolt	A lock bolt which is activated by key or thumb-turn, is square on all edges, and has no spring behind it.
Latchbolt	That part of a lock which, because of a spring device behind it, slides in and then springs out to hold a door in position when it is closed.
Strike	The plate recessed into the door jamb, into which deadbolt or latchbolt fits when the door is closed or locked.
Case	Containts major lock components; the mortise type fits into the door and the rim type is fastend to the surface of the door.
Cylinder	A removable unit on high-grade locks which contains the tumblers and receives only the correct key, which when turned operates the lock.
Backset	Horizontal distance from front surface of lock to the center of knob or cylinder.
Spacing	Vertical distance between the center of cylinder and the center of knob.

CYLINDER TYPES

Miwa Lock offers four cylinder types, U9 cylinder (rotary cylinder), PR cylinder (two-way rotary cylinder), JN cylinder (reversible-pin cylinder), and LB (variable tumbler cylinder). These are geared to Miwa Lock's master-keying, grandmaster-keying, cross master-keying, and other keying systems.

U9 Cylinder (rotary cylinder)



Features

■Good for large and Complicated Keying

With nine tumblers positioned four-deep in nine double-sided chambers, this lock boasts 150,994,944 possible number of key combination.

■Superior Durability

Cylinder life is extended by the use of phosphor bronze, which is extremely wear-resistant.

■High Security

In addition to having ultrasafe rotary tumblers, the U9 features nine four-deep tumblers, making it extremely difficult to pick.

■Available keying systems

- ● Master-keying system
- ● Grand master-keying system
- ● Great-grand-master-keying system
- ● Multi-master-keying system
- ● Common keying system
- ● Keyed-alike system
- ● Construction keying system
- ● Display keying;emergency keying system

Principles

1. Locking bar stays in V groove of cylinder body and prevents rotation of plug when locked.

2. Tumbler notches line up and give room for in-and-out movement of locking bar with change key insertion.Then locking bar is retracted by plug rotation according to slope-contacts between locking bar and cylinder body.



Keyway shape



Key shape

Fig.1

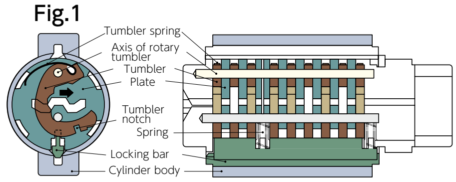
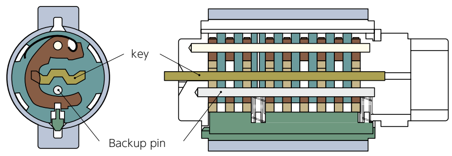


Fig.2



CYLINDER TYPES

PR Cylinder for housing complex(two–way rotary cylinder, reversible key type)

Features

■A two–way rotary tumbler cylinder with high security

The PR Cylinder has a 2–way construction consisting of main and side tumblers whose contact surfaces are different, giving 100 billion possible number of key combination.

■Enormous number of key combination

Eleven tumblers in eleven chambers, whose main and sidetumblers are positioned at four–level and two–level respectively, give the lock 100 billion possible number of key combination.

■Superior durability

Like the U9 Cylinder,PR has extreme dust–proof and wear resistance.

■High security

The cylinder is extremely difficult to pick because the locking bar does not rotate until all tumblers are aligned at the same time and the anti–picking structure has a complicated shape. Also PR is highly resistant to drilling due to the use of extremely hard parts in the cylinder.

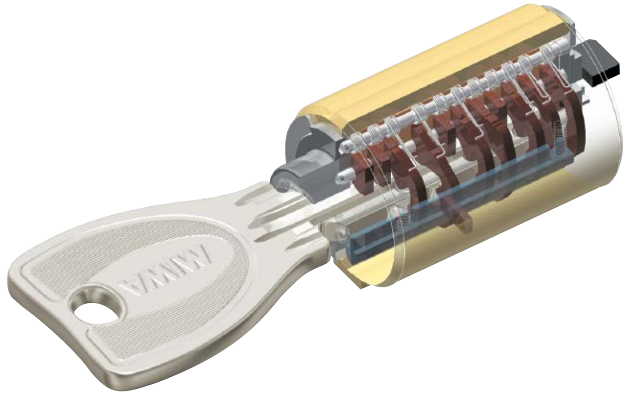
■Available key systems

- ● Master–keying system
- ● Keyed–alike system
- ● Grand master–keying system
- ● Construction keying system
- ● Multi–master–keying system
- ● Double construction keying system
- ● Common keying system

■Square Cylinder available.

Square Cylinder is also available. Specifications differ from those for a standard cylinder.
Please refer to P206 for details.





Principles

1. As shown in Fig. 1, without the key inserted, the locking bar is pushed by a spring into a groove on the cylinder body. Also, the tumblers are pushed by tumbler springs. In this condition, the cylinder plug is impeded by the tumblers (because the tumbler notch is not above the locking bar); therefore, it is impossible for the locking bar to rise, and it is impossible to turn the cylinder.

2. When a standard change key is inserted, the tumblers are pushed in by the key cuts and rotation occurs until the notch lines up with the top of the locking bar. In this condition, the taper of the groove and locking bar works against the spring, and the locking bar is pushed up, making it possible to turn the cylinder plug.

Fig.1
Without the key inserted

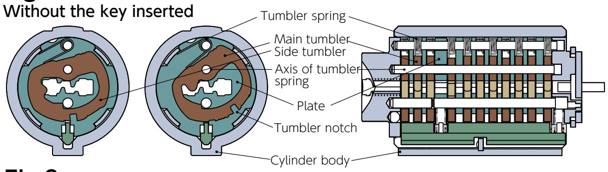
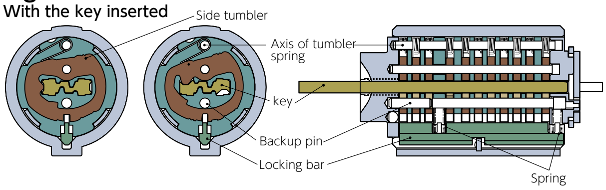


Fig.2
With the key inserted



PR cylinder



Keyway shape



Key shape

PR–J cylinder



Keyway shape

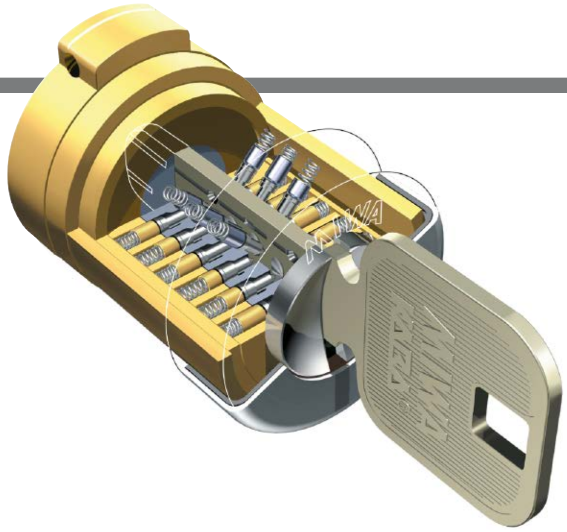


Key shape



Key shape
(for barrier–free locks)

CYLINDER TYPES



JN Cylinder(reversible-pin cylinder)

Features

■Enormous number of key combination

Twenty-one pins-eleven four-level horizontal pins arranged in two rows, and ten two-level diagonal pins arranged in two rows-give this lock 17.2 billion possible number of key combination.

■User-friendly cylinder

Because keys are reversible, it is never necessary to flip a key before inserting it. Also, entirely concave keyways make it easy to insert the key even when it's dark.

■Superior durability

All tumblers are made of stainless steel and are, therefore, highly wear-resistant and durable. This cylinder can be safely used even for common entryways, which have a high frequency of use.

■Exceptionally difficult to pick

High-precision diagonal pins make this cylinder exceptionally difficult to pick.

■Perfect for use in hotels

Because their keys are difficult to duplicate, this cylinder provides high security even when used in places like hotels.

■Available keying systems

- Master-keying system
- Grand master-keying system
- Great-grand-master-keying system
- Multi-master-keying system
- Common keying system
- Keyed-alike system
- Construction keying system
- Double-construction keying system
- Display keying, emergency keying system

Principles

1. As shown in Fig. 1, without the key inserted, pins are pushed through the cylinder body and cylinder plug by springs, making it impossible to turn the cylinder plug.
2. When a standard change key is inserted, the pins are pushed out to line up with the shear line and it is possible to turn the cylinder plug.

Fig.1

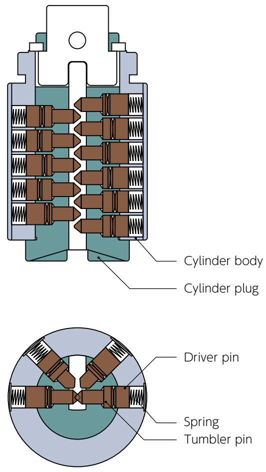
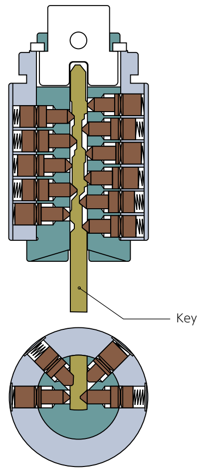


Fig.2





Keyway shape



Key shape

CYLINDER TYPES

LB Cylinder(variable tumbler cylinder)



Features

■High security and high functionality

LB cylinder ensures high security and high functionality by using variable tumblers with our unique variable mechanism arranged in 13 rows, and upper and lower locking bars that are very resistant to unauthorized unlocking.
The main tumblers have 4 positions each, and the side tumblers have 2 positions each.
Theoretically, approximately number of key combination is 26.1 billion.

■Prevention of picking and unauthorized unlocking

The locking bar system (two bars, upper and lower) allows the cylinder to turn only when the tumblers in all rows are aligned simultaneously. The use of grooved anti-picking tumblers realizes high resistance to picking due to the extreme difficulty to discriminate the correct notches from the grooves.

■Resistant to attacks by drills and hole saws

As a number of high-hardness parts are used in the cylinder, it is very resistant to attacks by drills and hole saws.



LB cylinder



Keyway shape



Key shape

LB-J cylinder



Keyway shape



Key shape



Key shape
(for barrier-free locks)

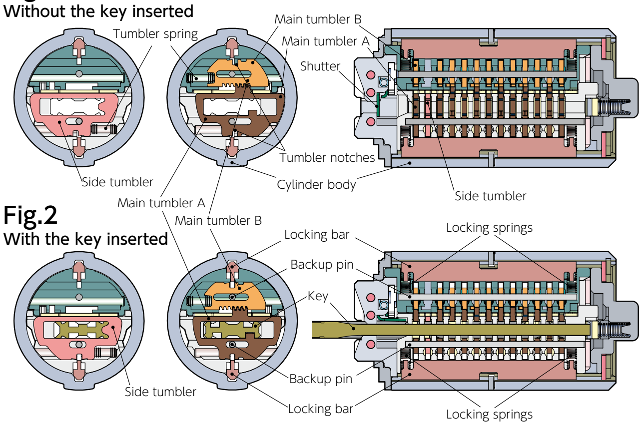
Principles

1.As shown in Fig.1, without the key inserted the upper and lower locking bars are pushed by the locking springs into the grooves in the cylinder body.
In addition, the tumblers are pushed by the tumbler springs. In this condition, the bars are impeded by the tumblers (because the tumbler notches are not above or below the locking bars), and the locking bars cannot enter the cylinder. Therefore, the cylinder cannot be turned.

2.When a standard change key is inserted, the tumblers are moved to the right and left by the key cuts, and the notches are aligned just above and under the locking bars. In this condition, the taper of the grooves and locking bars counteracts the springs to set the locking bars in the notches in the aligned tumblers, and the cylinder can be turned.

Fig.1
Without the key inserted

Fig.2
With the key inserted



Available keying systems

	Free selection type (with master key)	Free selection type (without master key)
Master key variable system	●	
Master keying system	●	
Grand master keying system (Note 1)	●	
Multi-master keying system (Note 2) (Note 3)	●	●
Common master keying system (Note 2) (Note 3)	●	●
Keyed alike	●	●
Variable construction keying system	● (Standard)	● (Standard)

Note1 : In case of the grand master keying system, each affiliated MK group is provided with a neutral key and security card set applicable to all rooms.

Note2 : Cylinders to be multi-master keyed or common-master keyed do not possess the variable function. As the cylinder structure is different from the structure of cylinders possessing the variable function, the keyway position is slightly different.

Note3 : Even if keys are changed, the cylinder to be multi-master keyed or common-master keyed can be used without any changes.

Features

High-precision key with double inline and dimples

High-precision processing is required for the complicated inline and dimple positioning. The key cross-sectional shape is designed using our unique technology (PAT). Accordingly, keys cannot be copied by other companies, and high levels of security can be maintained.



Provision of a clicking function to indicate the key insertion and removal positions

A click is given out when the key reaches the removal position when it is being turned, allowing for reliable operation of the key.

Large keyheads are also available.

Keys can be provided with large keyheads in order to facilitate key operations.



Change key system provided as a standard option

The variable cylinder is provided with a change key system that disables the previous key and allows for the locking and unlocking of a room with a new key without replacing the cylinder even when the tenant changes or the key is lost.

When the tenant changes | **When the key in use is lost**

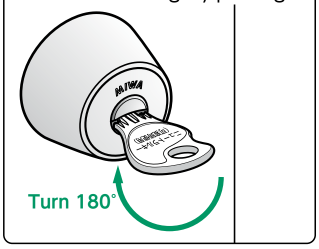
- **Anxiety about wrongful use of the key by the finder**
- **Expenses for replacement of lock and key**
- **Time required for replacement of lock and key**

The LB Key System can immediately eliminate such anxieties without replacement of the cylinder.

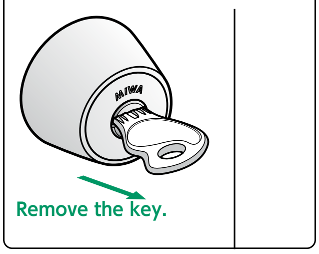
The LIBERO Key System disables the previous key and allows the user to use a new key to lock and unlock the room without replacing the cylinder.

Procedure for changing room keys

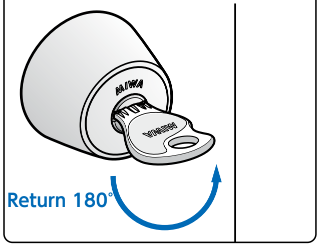
(1) Insert the **neutral key**, and turn it 180° while slightly pushing it.



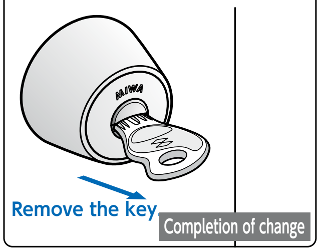
(2) Remove the **neutral key**.



(3) Insert the new **room key**, and return it 180°.



(4) Remove the **room key**.



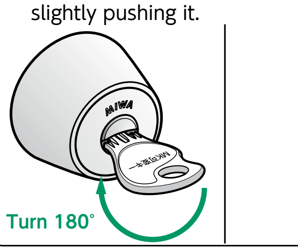
Master key is changeable. (Option only for systems with master keys)

When the master key is lost or the management firm of the rental apartment changes, the master key can be changed once through a simple operation.

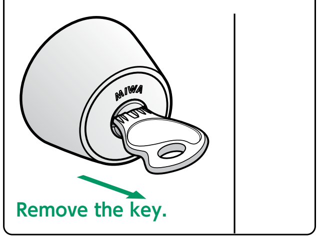
＊When the master key is changed, the neutral key must also be replaced.

Procedure for changing the master key (Procedure to be conducted for all rooms)

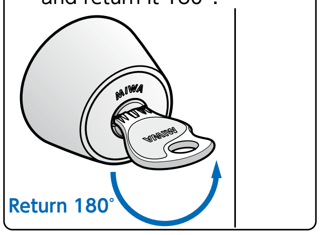
(1) Insert the **MK variable key**, and turn it 180° while slightly pushing it.



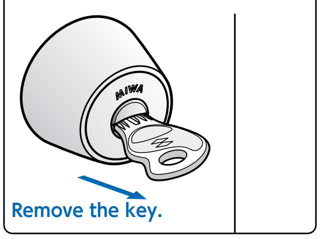
(2) Remove the **MK variable key**.



(3) Insert the **room key** borrowed from each tenant, and return it 180°.



(4) Remove the **room key** to finish the procedure.



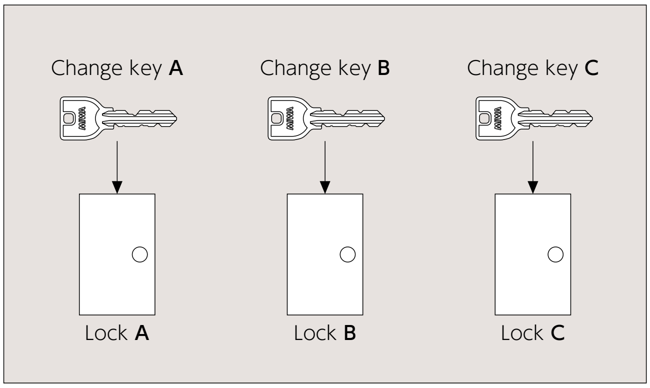
＊For GMK buildings, it is necessary to change the master keys for all rooms of GMK groups.

KEYING SYSTEMS

There are many types of keying systems. You can combine types to meet your specific requirements.

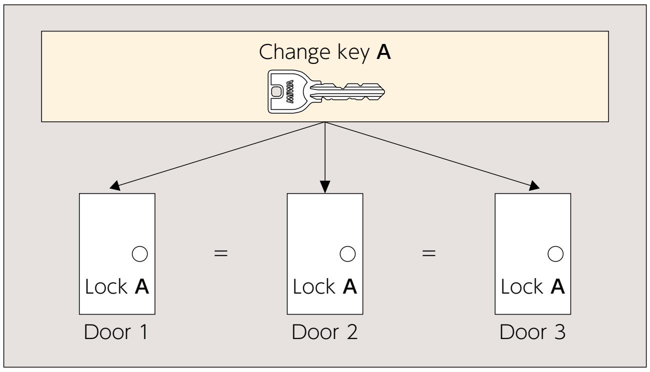
1 Change Key (C.K.)

Each individual lock has its own individual key, and there is no master key.(M.K.)



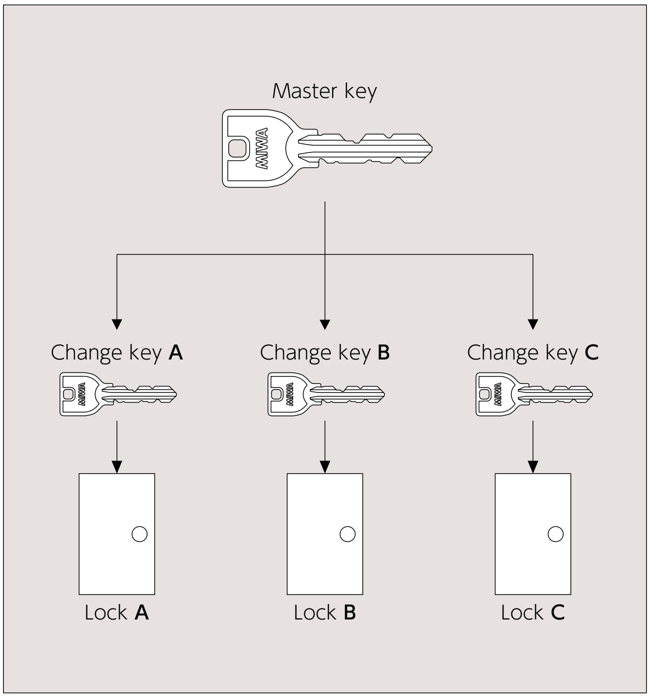
2 Keyed-Alike (K.A.)

A system wherein a number of locks have the same cylinder construction (key number), and each individual key that operates one of the locks can operate all of the locks.



3 Master-Keying (M.K.)

A system wherein several different locks are combined in one group, and one key (the "master key") can open all of them.

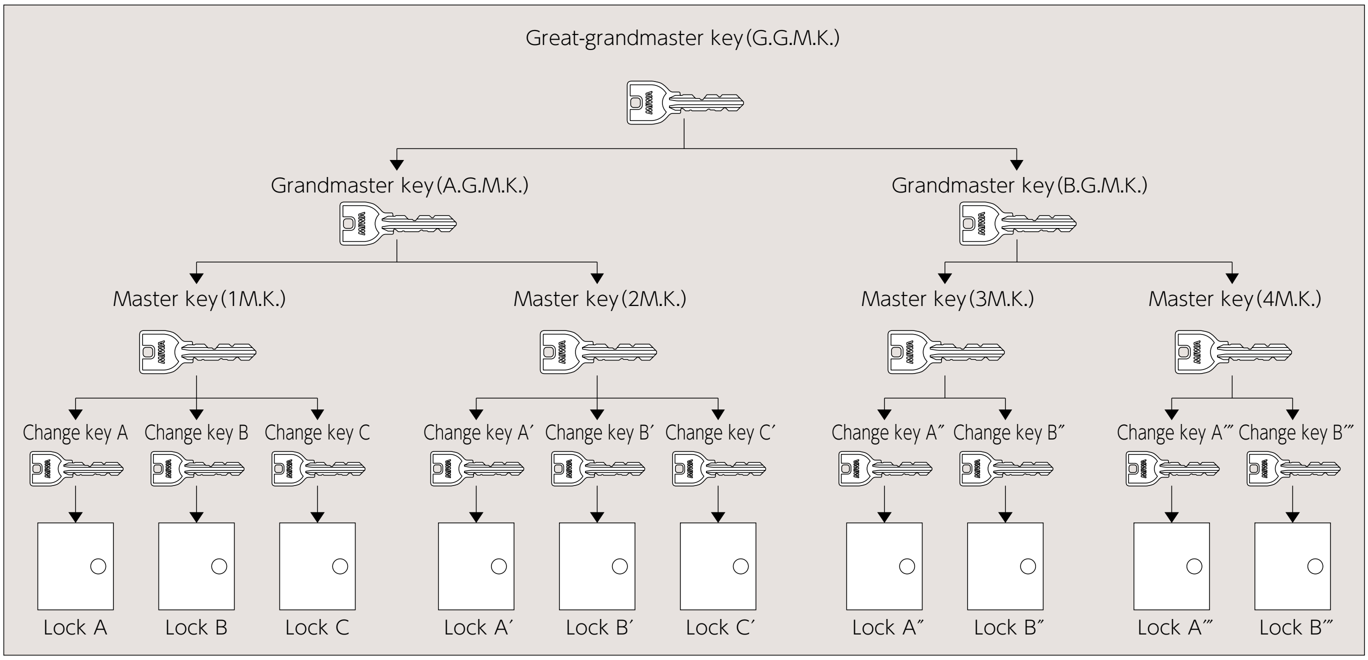


4 Grandmaster-Keying (G.M.K.)

A system wherein one key (the "grandmaster key") can operate several different groups of master-keyed locks.

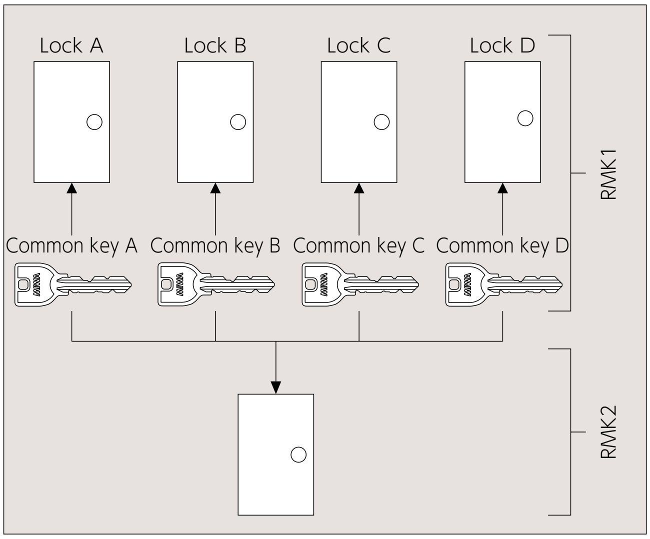
5 Great-Grandmaster-Keying (G.G.M.K.)

A system wherein one key(the "great-grandmaster key") can operate several different groups of grand master-keying systems.



6 Common Keying System (R.M.K)

Each key can individually open its own lock. However, it can also operate one or more other locks.

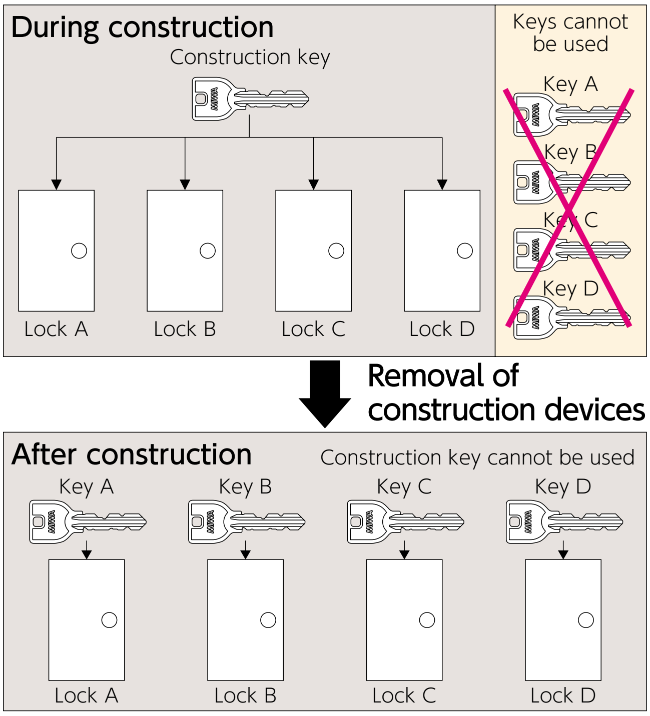


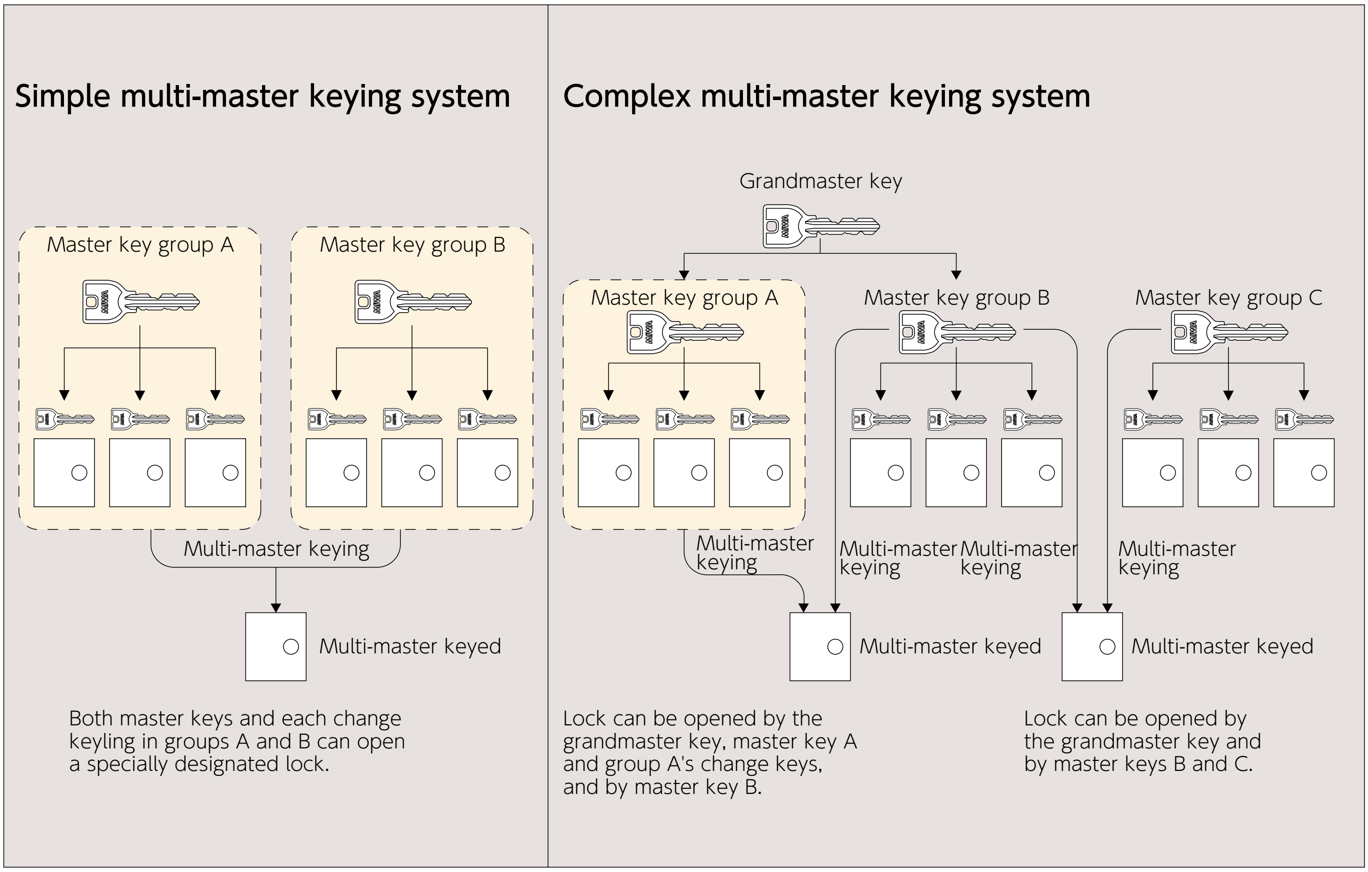
7 Multi-Master-Keying (M.M.K)

A system wherein the master keys of several different groups of master-keying systems and all the individual keys therein can operate the lock(s) of a designated location. The master keys and individual keys are called "multi-master keying" and the designated locks are called "multi-master keyed".

8 Construction Keying System (C.N.K.)

After completing construction, the contractor gives a new key to the owner or his tenant. The new key nullifies the existing key and can operate locks without the need of replacing cylinders.





Note : Multi-master Keyed Systems involve many related master keys and change keys, so special care should be taken to avoid the loss of master keys.